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Course Code	Course Title
SENG2260	Human computer interaction
(Example) ABCD1234	*(Example)* Intro to University

Campus of Study: Callaghan (eg Callaghan, Ourimbah, Port Macquarie)

Assessment Item Title: Assignment 2: High Fidelity Prototype Report Due Date/Time: 29/10/2021 11:59

Tutorial Group (If applicable): Thursday 2pm- 4pm Word Count (If applicable):

Lecturer/Tutor Name: Shamus Smith

Extension Granted: [ ] Yes [X] No Granted Until:

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Tutorial Group (If applicable): Thursday 2pm- 4pm Word Count (If applicable):

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2021

Team Awaken Report 2

ANALYSIS OF THE HIGH-FIDELITY PROTOTYPE

ALEXANDER FRASER, ANDREW COX, AUSTIN BAXTER, BROCK BRINKWORTH, HAMISH TYNAN, JOSHUA CORRIGAN, WEI CHEN

Contents

Problem Domain

The problem the art gallery interface attempts to solve is the lack of participant interactivity when browsing the exhibits. Traditional art gallery experiences are static in their execution, with visitors merely experiencing art through a simple and standardised methodology that includes looking at the art, reading the information nearby and then moving to nearest art piece to repeat the process, our interface aims to provide greater engagement by giving the user many options to experience the exhibits through our orb curator and make even the mundane experiences like navigating the museum more stimulating through interactive navigation such as mini-maps and virtual footprint paths.

The users that the interface is built for will be for the average museum visitor, designed to be easy for participants to learn with accessible concepts such as the mini-map being reminiscent of the traditional map layouts found on physical pamphlets or at the museum entrance, whilst also being non-intrusive for users that wish to only use select aspects of the interface during their tour.

The important tasks users will come across when using the interface is the additional information that can be extracted from the art pieces, including the different forms this information comes in such as through audio. Another important task users will experience will be interacting with the curator orb that will provide a different way to exploring the museum. Finally the interface's navigation will be an important tasks for users to use to further explore the exhibits or to find certain amenities during their journey such as restrooms or staff assistance, the interface navigation will also discourage and lead users from accessing staff-only zones.

User's will have the best experience when they are open to new ways to engage with the museum's art, and are in a calm state of mind to enjoy and immerse themselves in the exhibits, the interface is there to make their time in the museum more fulfilling and memorable, not as a burden

Design decisions

Design - Orb

The orb was designed around simplicity and ease of use, as well as the teams desire to have a more centralised area for most of the headset's features, meaning the orb should be simplistic and visually appealing. For the visual design, it was heavily inspired by the coven orbs from the coven 2021 event within league of legends as well as Ari's magical orb from league of legends. Combining these two inspirations along with a general need for some gimmick for the system we created a visually distinct and quite unique interactable object that is the corner stone of the system.

For the functionality of the orb, we went with whatever felt the most intuitive to us. This being namely to summon the orb you raise you hand with the palm up; you can then move it around and banish it by "crushing" it. The other important gesture for the orb is how you gain access to the more information tab, to do this you swipe from the centre of the orb out almost dragging out the more information tab. This tab follows the design style of the orb, whilst lacking the whisps and vines it keeps the colour palate and softened shapes.

Design - Interacting with a painting

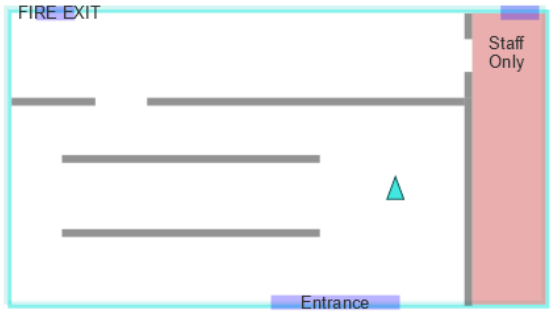
- Removing redundant buttons that distracted and confused users
- The green arrow is a feature of the prototype and would not exist if the design was properly set up using an AR headset. Clicking the green arrow will send the user to a different part of the prototype to allow the prototype user to easily flow through the entire prototype without having to reload different Justinmind sections.

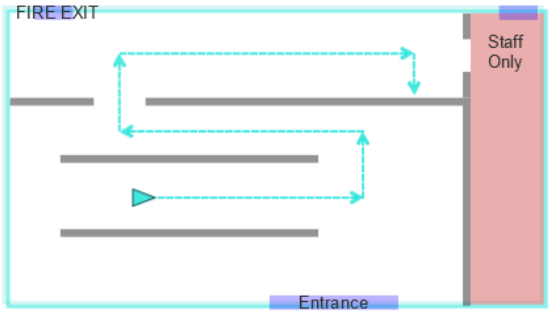
- All colour and font choices were centralized around the orb and the clash between the colours and expressly ensuring the opacity of the orb and fonts/colours still created an easy-to-read design.

- The gesturing to control the orb was seen as the easiest way for the users to gather more information on a particular painting.
    - The orb will float in-front of where the users summon it to be completely usable for those missing an arm.
- Using buttons for the audio and text boxes allows for error free option choosing without the worry of using too many gesture controls as for those with shaky hands it's a real possibility that when trying to access the "Text" or "Audio" they will unintentionally close the orb if those options were accessible through gestures.
    - While audio is playing the user will be unable to click the "Audio" button again and the "Audio" text will be changed with "Playing".

- The text box expanding the orbs window when pressed allows for the user interface to stay as small as possible to not obstruct the user's vision when orb is active. This is a safety concern as even though the background behind the orbs interface is still visible due to the opacity of those objects it still impacts the user's ability to see clearly.

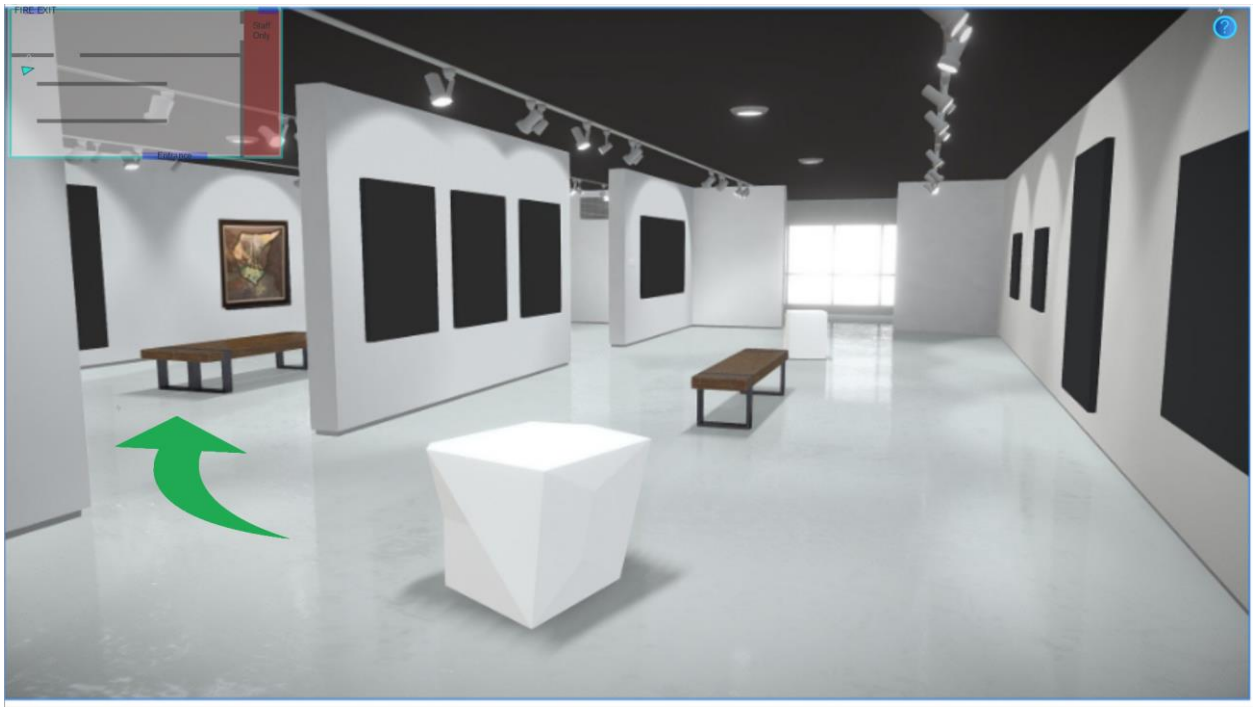
Design of Map



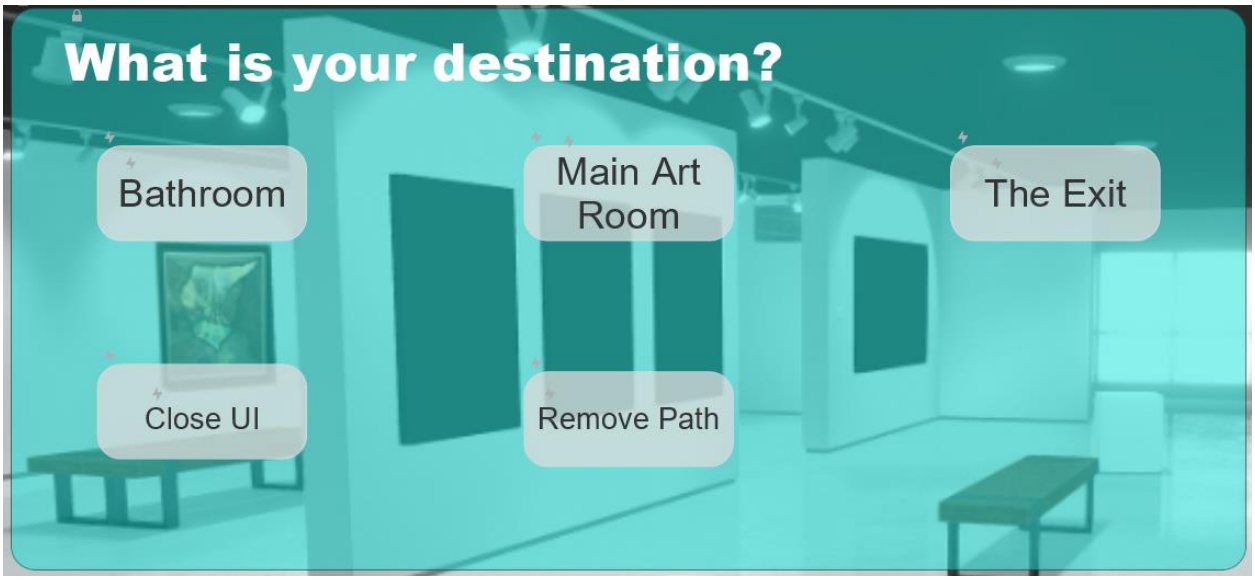


- The first iteration above is of the map designed in the high fidelity prototype from the original lower fidelity design which had been improved upon

- Below is the first thing users were shown in scenario 2 and 3.

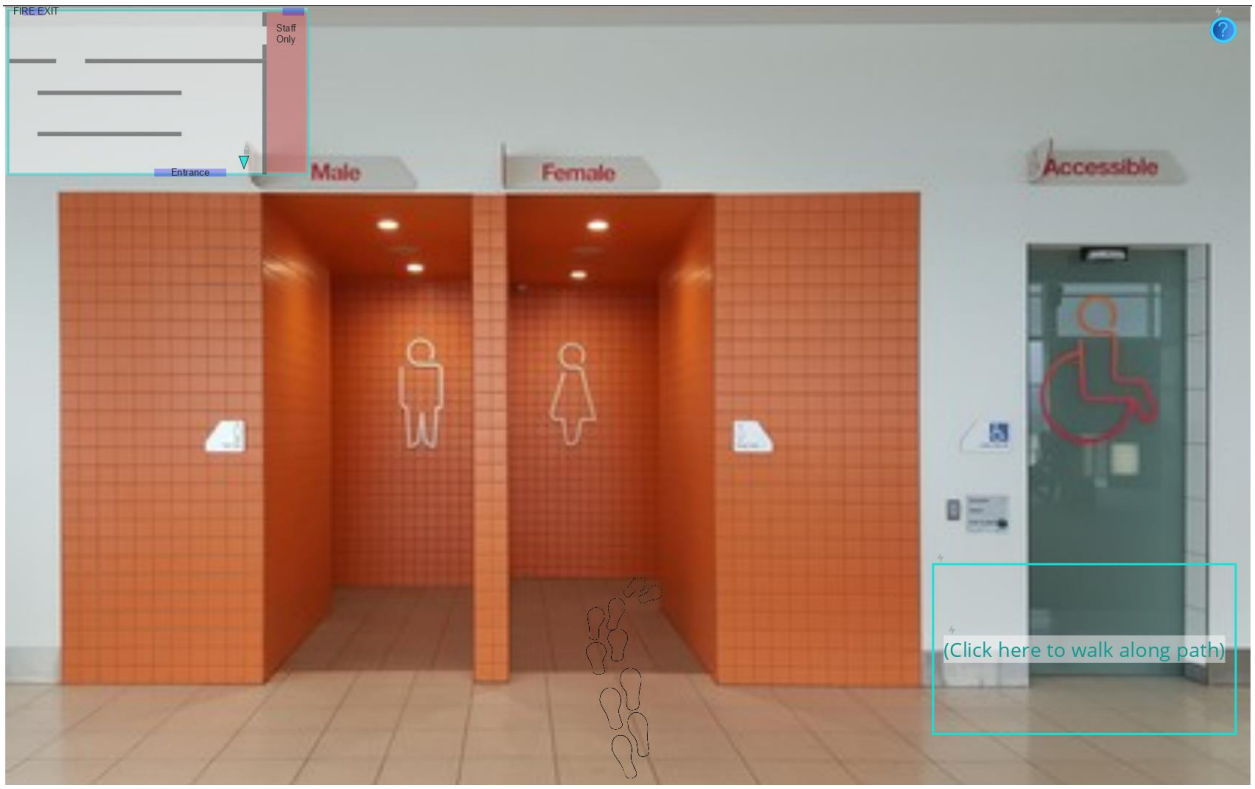


- A feature introduced into the map design was the ability to interact with the map by clicking it. This then opened a user interface dialogue box which prompted the user to choose a destination, remove a path way for the destination or close the user interface dialogue.



- The next features that were implemented, in the picture below, were the directions on the map drawn when the user chose to be directed somewhere (Along with feet directions on ground that was not designed by myself). This feature was thought to help in directing a user to their chosen destination.

- In the bottom right of the above picture, the interaction with the ability to move along the directions given to the chosen destination was derived. The interaction results of this button is shown below.


FIRE EXIT
Staff Only
Entrance
Male
Female
Accessible
(Click here to walk along path)

Prototype Implementation

The high-fidelity prototype was developed using “Justinmind Prototyper” which converts the linear path of the low-fidelity prototype to a more dynamic experience for the user. Where the low-fidelity prototype required someone to assist the user through it the high-fidelity prototype aims to let the user explore the project themselves. This will help let the developers know if the features they are creating are intuitive and helpful to the end user. In this high-fidelity prototype the user is able to use a computer mouse on things to simulate interacting with a UI element in the VR headset. This will simulate hand gestures such as raising a hand to get the orb and pressing UI elements such as in the tutorial. The ‘pressing’ of elements was done with a click of the mouse but there is also a click and drag feature to simulate the user raising their hand for the orb. The benefit of clicking is that its quite precise compared to an actual VR program which may have problems with detecting exactly what the user are trying to do with their hand. One problem with the prototype relating to simulating hand gestures is that for the summoning of the orb the click and drag is hard and took many participants multiple tries. With practice is became easy but if the user tried to summon the orb and it did not arrive the user of the prototype may have thought they are doing something wrong possibly skewing useful feedback from the prototype.

Movement within the prototype was also quite limited compared to the real possible use of the program. The user could only move on rails in two different paths and was therefore railroaded into using the programs features at specific locations, limiting the possible discovery of malfunctions in the program. However, the UI was more dynamic as that is what the prototype software was designed for, with the user able to go back and forward through menus at any point.
The simulation of the gallery was limited and not based off a real gallery so the depth was only what could be combined from images found online and not a contiguous real art gallery. Since the user could only access a surface layer of how the program would run in reality, the discovery from the prototype was limited.
The software we used was really designed for user interfaces such that of a web or desktop application. Leading to a few feasibility problems in using it to prototype a VR program however I believe that it showed more than just the idea of features and was able to display and provide user interaction with technical aspects of the program for feedback.

Evaluation

Testing Process/Design

An issue that stood out at the beginning of the design process was finding a selection of test users (testers) representative of the target demographic. Early research in the design process indicated that overwhelmingly art galleries are patronised by people aged 45+ and women. This meant ideally a large portion of testers would be women over the age of 45. However, as outlined in the assignment brief, only other students taking SENG2260 were allowed to be used as testers, resulting in the pool of potential testers overwhelming under the age of 30. Additionally, due to SENG2260 being undertaken primarily by students in IT, Computer Science and Software Engineering degrees, the potential testers were likely to have a level of technological competency not representative of the general public's. Whilst these factors were identified as significant issues in the testing process, the scope of the course didn't allow for much to be done to mitigate these concerns. However, testers were instructed to act as if they only had an average level of tech competency and in their testing not to attempt any advanced configuration or debugging if they encountered errors in testing. Our testers were found by facilitating a prototype exchange with another group within the course, with us testing their prototype and them testing ours. The group was one of the other groups that participated in our course laboratory/tutorial session.

The testers were briefed from a single page document containing contextual information about what the prototype was designed for, who the target demographic is, generalised instructions and the specific tasks and scenarios needing to be tested. It was decided not to give testers a demonstration of the interface before testing as one of the desired testing scenarios was the successful completion of a tutorial that would be used to give patrons necessary interface orientation. User testing was conducted virtually, as was required at the time due to covid-19 restrictions. Given said covid-19 restrictions also limiting access to appropriate hardware, virtual testing was the preferred medium due to only being able to produce a simulation of the prototype.

Using Microsoft teams, each tester was placed in an individual call with an observer (who was a member of the design team). The tester was then provided the briefing document to read through and an URL which lead to a functional simulation of the interface. In the briefing, the tester was asked to screenshare as they navigated through the provided test scenarios in the briefing. The tester was asked to narrate their mental dialogue as they used the interface, with the observer taking notes. The testers were also asked to consent to the testing session to be recorded so both their actions and narration could be recorded and reviewed for later analysis.

Three scenarios were outlined in the testing brief that the testers were asked to complete and review. The 1st scenario was a tutorial that teaches the user how to use and interact with various elements of the interface, in particular, a virtual assistant/tour guide known simply as "the orb". This was important as the orb was a novel element of our interface design and any given user could not be reasonably expected to have familiarity with the controls for, or functions of, the orb. In this scenario the tester was asked to successfully

complete this tutorial section, and this was broadly divided up into 4 tasks to help guide the user through the process;

1. Start the tutorial
2. Summon and then dismiss the orb
3. Use the orb to discover extra information about an artwork
4. Complete the tutorial

This scenario also gave the testers the knowledge of how to utilise the interface to successfully navigate the other 2 scenarios in the testing.

Scenario 2 asked the testers to use the interface to find extra information about a given artwork, such as the artwork's name, the artists and/or a small paragraph of information about the piece, akin to what a tour guide might tell you, or an information plaque. The testers were asked to;

1. Access the extra information section
2. View artwork information in text form
3. Listen audio detailing information about the artwork
4. Dismiss the extra information section

Finally scenario 3 asked the testers to use navigational functionality built into the interface that could be used to guide a patron to a facility within the gallery, such as a bathroom or the exit. The testers were asked to;

1. Navigate to the bathroom
2. Cancel navigating to the bathroom before reaching the bathroom
3. Navigate to the exit of the gallery

After the 3 scenarios were completed the observed asked the tester for any reflections, observations or generalised feedback in regards to the prototype.

The test scenarios and tasks used were very similar to those used when testing the low-fidelity prototype. This was important as it allowed to examine if we had adequately addressed the usability issues discovered in the low-fidelity prototype, and reflect on changes made to the design since. To aid in that endeavour, the same group of test users was used so they could provide reflective feedback between the low and high fidelity iterations. However there were some changes made in the test scenarios, in particular surrounding the usage of the orb as its role within the interface expanded significantly.

The actual method of testing changed noticeably too. When testing the low-fidelity prototype, Wizard-of-Oz testing was utilised to simulate user interactions with the interface. This allowed for rapid on the fly modifications and alterations when issues were discovered in testing. For the high-fidelity prototype a functional simulation was developed and testers were able to interact with the prototype directly. This produced a much more realistic experience for the tester when using the prototype, however had the downside of relying on the tester to remember to narrate their thoughts rather than it being required to interact with the interface at all.

Results

User issues

- Some functions of the program used to show off the prototype were buggy and which allowed some of the users to believe they were doing the wrong action to reach the objective of the test.

System issues

- The system issues that were found from testing can be separated into the scenarios as shown below.

Scenario 1

- Swiping was slow and didn't work very well
    - The swiping functionality in the program just in mind was very buggy. When the user attempted to swipe the page across there was a chance nothing happened or it would take a long time to register. Testers experienced confusion about whether the tutorial section of the prototype was the whole testing experience
    - In the tutorial stage of the demonstration testing, some users stated that they did not know if the tutorial was all the scenarios and did not know that they were just starting.
    - This confusion might have been because the tutorial was mostly just explaining the controls to the user on how to control the scenarios. The tutorial had a big user interface box in the centre of the screen which easily led the user through the controls, but when it finished it put the user into a low user interface volume scenario with no objectives clearly on screen. This was because the brief that clearly marked the objectives was given before the user started the tutorial.

Scenario 2

- Pulling up the orb was very difficult
    - When the user tried to bring up the orb, most of the time it would not work, which would lead the user to believe they were not doing the right action.

Scenario 3

- User Interface was not the same as in other scenarios
    - The user interface in this scenario was different because it was implemented at an early stage and did not receive an update before completion. The other scenarios had different user interfaces, and this confused some of the users testing the scenarios. The users then had a pause before proceeding since they did not recognise the user interface.

- Clicking a box to move along the directions to the next area was not a very good way of implementing it
    - The implementation of the user being able to walk along the given directions after choosing a destination was not the best. There was a box in the bottom right corner which when interacted with allowed the user to go to the given destination.

Analysis of results

The user testing results provided valuable data for use in future next steps in the prototype development.

The tutorial showed interesting trends in engagement with the instructions and repeated usage. 80% of the tested users progressed through the tutorial and properly read through each step as planned, however concerns were brought up by users that the text was not engaging enough to properly analyse, so a redesign of the tutorial to provide assistance with less text either through the use of images showcasing the features or perhaps even a video/scripted tutorial with the orb could be used to increase user engagement.

20% of our test users interestingly displayed confusion towards the end of the tutorial that they were still doing the tutorial, whilst this percentage is not severe enough to warrant a major rework of the design, potentially a simple header text called “TUTORIAL” could be added to the top of the tutorial window to alleviate confusion.

A major source of concern found during testing was that all test users found themselves accidently going to a previous section of the tutorial, resulting in them having to complete tasks in order to progress again, 60% of users noted that the wording used to teach them how to swipe to the next page was disorienting, stating that they would intuitively swipe in the opposite direction than instructed to go forwards. Interestingly these users only had difficulty in using the swipe mechanic towards the end of the tutorial, as the introductory page and the orb tutorial did not have any incidences of accidental backtracking observed. Wording on the last page of the tutorial tells the user to “Swipe right to left to exit the tutorial”, so it is possible that these users first read “Swipe right” and tried doing that before reading the full sentence, causing them to only move the mouse right and moving to the previous screen, so rewording this sentence may reduce future confusion. An additional failsafe could be physical buttons on the tutorial ui to move between pages without the touch functionality.

Other minor issues found with the tutorial included users that have accessed the tutorial later in the prototype having to complete the entire tutorial from the beginning, which users found annoying to deal with and can be fixed with a simple exit button, and for further convenience to the user experience having the tutorial objectives completed permanently after the initial introduction to prevent users having to redo parts they already know to get to their desired section.

The art piece interaction by the users shows that more work is needed to make the user aware of the orb’s presence and purpose, 80% of users, when attempting to learn more

about the art piece, instinctively clicked on the blue ? button on the top right, which instead restarted the tutorial from the beginning. During the user's reflection many were drawn to the tutorial button as the main way to progress, with 2 users even forgetting the orb was an option despite completing the tutorial a minute before. This shows that there's need to be a greater indication that the orb can be used either in the form of an effect around the painting or a pop-up reminder, text reinforcing that the button at the top right is a tutorial is a simple solution to prevent people from clicking that accidently

Regarding the navigation system 60% of users noted that they liked the clean map design, they thought it was easy to follow and could understand how to use it, however some users pointed out the lack of variety in map locations and confusion with the bathroom not appearing on the map despite it being a travelable location (the bathroom was next to the entrance/exit which did get put on the map), one user suggested an option to close the map menu without removing the footprints on the ground, as closing the menu exited the navigation mode entirely, This can be fixed easily by the splitting the button into two separate buttons.

Half of the users recommended greater connectivity between the navigation and prior scenario, as the navigation only led to amenities but could in a future iteration be used to lead to art pieces in the exhibit. The orb was also mentioned as a potential navigation tool that could be integrated as well

Regarding the interface style, users praised the sleek "sci-fi" look, however users noticed the different colours used between the different scenarios and would have preferred the colours to stay consistent. Interestingly there was mixed feedback between the transparency of the interface, some found the navigation menu hard to read whilst other users stated the opposite, that the menu was clear and the transparency was good, a problematic piece of feedback to review as the sample size of users with an opinion on the transparency was low and with the group that did have one it was exactly 50/50 for and against the transparency. A potential issue that could be solved with future interface customisation options for users to set it to their specifications

Reflections

What was learned through the iterative design process?

During the design phase of the low fidelity prototype, the concept for a personalised tour guide was purposed, it was supposed to move from artwork to artwork, providing commentary, answering questions, and interacting with the piece in unique ways. After creating some basic designs for this concept, it was found that this character may come-off as annoying to our target demographic, so the concept was reworked into a personal assistant reminiscent of Amazon Alexa or google assistant. This went through a few design iterations from a fay (think Navi from legend of Zelda) to a decorated orb that the user can summon by holding their palm face up. The orb was later iterated on to include an optional menu that would allow for the user to attain more information on their desired painting. Through the process of iteration, we found out that simplifying the design of the companion and making it entirely optional, made it seem less annoying and that it didn't distract from the artwork at all.

Initially the design of the UI had a lot of clutter around the screen space such as a compass, a map, and navigation buttons. Most of these features where scrapped or absorbed into other features (for instance the compass was absorbed into the orb to function like a traditional compass) to reduce screen clutter, these changes where made based on a combination of user feedback from the low-fidelity prototype as well as the general idea of keeping the UI un-obtrusive.

What would be done differently?

When redesigning the low-fidelity prototype with the feedback received from the peer evaluation to create the high-fidelity prototype it was found that we needed to come up with a consistent colour palate and theme. For this we chose something reminiscent of halo's design with bright electric blue borders with thin electric blue inlays and fairly opaque backgrounds that fogged out but didn't totally obscure the user's view of what is behind the UI elements. Combining this with rounded corners and nonstandard inner card sizes, it landed itself to a futuristic but not alien look for the UI. However, this colour scheme and thematic whilst befitting a sci-fi space adventure did not suit the aesthetics of an art gallery we would have fared better if we had used a more subdued colour palate to make the GUI blend into the background and for the orb to pop out. With that said the GUI could have done with a more standardised colour palate at least, as in many of the different scenarios the colour scheme for the menu elements dents to change from an electric blue border with dark blue backing to a transparent aquamarine blue with no border. Harmonizing these two designs would have greatly increased visual consistency. Another approach to creating visual consistency instead of dulling the tones of the entire GUI would be to redesign the UI's elements to fit within the aesthetics of the orb, this could be done by changing the colour schemes of the borders and background's to match the colours of the orb, this combined with adding purple wisps and vines surrounding the borders snaking their way around it. These changes as above would create a more visually consistent design throughout the prototype.

For the High-fidelity prototype we attempted to recreate the actions and interactions the user would experience within the completed project, these included: Summoning and banishing the orb, using the orb to attain a brief overview of an art piece (similar to what a tour guide would provide), Using the orb to gain a more in-depth explanation on the history and meanings behind an art work (this would be via either text or audio), navigating a tutorial, navigating back to the tutorial, navigation of the gallery's amenities and cancelling the afore mentioned navigation of the gallery.

However, most of the above listed functions did not act as intended or only acted as intended under specific circumstances due to the limitations of not only our understanding of the JustInMind software but also the limitations of JustInMind itself, for example the orb feature has to be split into two separate sections within the prototype to show how it would work in both situations, for the brief overview it was demonstrated within the tutorial where the user was made to move the orb over a demo painting, whereas the more information section had its own portion of the prototype where the user could gain extra information about the painting from the orb's pop-out section. These two sections of the same feature with more time and more skill could have been harmonised into a singular feature.

During the concept stages for the High-fidelity prototype, we looked at using a piece of software called "HoloLens 2 Emulator" This would allow us to simulate a HoloLens and create a prototype that mirrored the real project. Using this we most probably would have been able to implement select features that where cut from the high-fidelity prototype such as being able to move the orb around and summon the "more Information" pop out anywhere the user desired rather than it being restricted to the bottom centre of the screen.

Risk Assessment

Risks from the low fidelity prototype

Orb

From the low fidelity feedback we received, it was apparent that some users may not have an idea of what the Orb's functionalities are. As we are incorporating more features into the Orb in the high fidelity prototype, we thought that a tutorial would be sufficient to brief the user on the Orb's functions.

Map and navigation

The feedback from the low fidelity prototype included a common complaint, which is the confusing navigation interface and unintuitive naming of buttons. For the high fidelity prototype we wished to reduce routes where the user could access navigation interface to a single, intuitive method. Our implementation allowed users to click on the map, which would present a list of destinations, as well as an option to close the list. Because the text-labelled buttons for navigation were removed, we also included the map as a part of the tutorial.

Risks in the high fidelity prototype

We wanted users to undergo a tutorial for the first time they start up the interface. The risk associated with such a tutorial is that we may expect users to be proficient with the interface after the tutorial, but in the real world many skip through tutorials. To prevent this, we made an interactive tutorial where each common function of the interface must be utilised, before the user can progress to the next stage. This also ensures achieving the main objectives, which is the user's familiarisation with the Orb, and the rework of confusing and redundant navigation routes.

Prototyping decisions

Feasibility of the prototyping software

Many different prototyping tools were discussed and tested when determining what software to prototype both the low and high-fidelity prototypes. Many important factors had to be considered when choosing the right software for our scenarios, the low-fidelity prototype needed layering and picture editing capabilities to allow us to construct the AR overlays in each picture. After much consideration we chose the program Adobe XD, we believe this program has allowed us to create the closest version to our initial sketched designs for initial testing. The high-fidelity prototype needed more powerful software with interactive capabilities and access to audio and gesturer controls, without these functions we couldn't create a prototype that accurately captured the key features/scenarios we envisioned.

Best usage of the testers

Study shows the longer an experiment goes on the less useful responses can be gathered form the participants. Understanding this we sought to only prototype the most essential parts of the envisioned program to not waste the participants time and save costs on prototyping useless features that at this stage of development don't need user feedback.

All the features that were prototyped and why

Augmented assistant "Orb"

One of the main features of our AR prototype is the augmented assistant designed to take the role of a tour guid, written information about each art piece, assisted navigation and a bridge to every AR feature. A complex and detailed feature such as this required the user's feedback and suggestions as interacting with the orb and many facets of its design with many different iterations of the orbs 'looks', from fay to ghost and finally orb.

Accessing more information on an art piece

When prototyping this AR program, we knew we wanted to create something that could replace important real features of an art gallery experience. Interacting with a way to understand more about an art piece was paramount to our prototype's development. The art is the most important part about a gallery experience and to gleam a painter's rational or a critics in-depth analysis of a piece allows users to appreciate and enjoy the art just that much more.

Directed guiding

If this prototype were to replace many staff of an art gallery that could be used to ask for directions and help the user navigate to a particular facility or painting this program must fill that need. The navigation AR software should be easy to follow and comprehensive enough to find the best path to a location, therefore proper user testing is required to model a navigation system that foremost is easy to use for new users.

All the features that weren't prototyped and why

Many features were discussed and initially prototyped to be tested but many complications arose during the low and high-fidelity prototype that led these features to be discarded or changed.

Curator heat mapping

This feature would have allowed staff/curators to view guests' movement and how long they stayed in places through heat mapping displayed on the floor. Allowing the staff to plan tours using the virtual assistant with average human traffic in mind and determining what art piece is getting attention and those that aren't. This feature was discarded and used to create the navigation feature as we wanted to focus on only the guests as users and the feature would require a high-level prototyping software to create useable data.

Emergency warning system

Initially the managers of the art gallery were able to display a warning on every AR headset at once in the case of an emergency situation that would guide the users out to the nearest safe exit. The idea was scrapped from prototyping after its inclusion in the low-fidelity prototype proved unfruitful and was deemed unnecessary as it is not a core feature of the envisioned design.

Restricted area

Another feature that was scrapped after the low fidelity prototyping tests was the restricted areas AR display. The staff only areas would be shown red and if the user tried to enter the display would display warning messages and fill the screen with red until the user left the restricted area. This feature also was not deemed core to the design and therefore scrapped until the project left the testing and alpha phases.

Prototyping techniques

Low Fidelity

For the low fidelity prototype, we used a "wizard of oz" or "Man behind the curtain" approach to prototyping our design. This methodology was chosen initially because of how easy it is to modify the order of the slides as well as the elements on each slide. This allowed for quick modifications to the prototype when it was being tested on other group members. When running through the final prototype it was ran similar to a Dungeons and Dragons game where the tester would describe the objective of the scenario as well as narrate the actions the user would perform, and the user would

High Fidelity

For the high-fidelity prototype, we created an approximation of the final project within a

program called JustInMind. The prototype whilst not 3D, utilised a few tricks to make it appear more real. One of these was slightly curving the flat images to give the appearance of depth to the user. The prototype also allowed the user to interact with most of the systems, however most of this was just having certain elements hidden until they where needed, one of these was the orb, in any scene with a painting the orb was always directly in front of the user it just needed to be revealed using a gesture. In the real project the user would use hand gestures to move through menus and summon the orb, however in the prototype short click and drag 'gestures' were used to simulate the gestures that would need to be preformed within an augmented reality space.

Evaluating the observation results

Our goal for the high fidelity prototype was to improve clarity of functions, reduce redundancy and improve interface cohesiveness, compared with low fidelity prototype. To this end, we have mostly successfully achieved the goals set.

Unintentionally, we tested with the same group as the low fidelity prototype. This may have limited the feedback's scope as they would be more focused on the improvements we made rather than an objective review of the interface. It is with this factor in mind, we note the lack of reports of new significant usability issues with the high fidelity prototype.

Scenario 1

Many issues arose during the testing due to our choice of presentation tools. Crucial interactions such as hand swiping (represented using justinmind's click and drag) were slow and buggy. Combined with the test subject's exposure to modern interface design, such as right to left wipe to proceed, conflicted without left to right swipes. This is to do with Justinmind's technicalities. However, some test subjects were unaware that scenario 1 is a tutorial and they are already evaluating a scenario. This is an oversight on our part and can be amended with a simple indicator or text label addressing the scenario.

Scenario 2

Scenario 2 presented the same technical issues we faced in scenario 1, with regards to the unresponsive interactions.

Scenario 3

Scenario 3's testing feedback, regarding this scenario's difference in visual style to other scenarios shows that the interface is not perfectly cohesive. This would not affect usability of the scenarios but could have been improved further. We regard this as a minor issue, as simple colour and size adjustments can amend this issue.

With more time to polish and tune the high fidelity prototype, we should resolve all the issues encountered in the testing. Additionally, we can provide local copies of the interface to the test subjects(we used remote copies hosted in the JIM domain in testing), which should resolve the remaining performance issues, if any.

Next steps

The high-fidelity prototype testing allowed us to gauge the participants reactions and interactions with our system. Using this data, we can work to improve the prototype and get it ready for development using an actual AR development software. Many user testing sessions will be needed to accurately gauge the likeability of the prototype while developing it in actual AR space. With many setbacks and design faults being expected but if we keep the design focused on what the users wants and needs, I'm confident our art gallery AR software can become a success.

- Fix up specific parts based on the high-fidelity prototype testing
- Based on testers feedback and market analysis continue improving the prototype and looking to create it in a proper AR system
- Using the University of Newcastle art gallery run testers through an actual art gallery and record feedback and improve
- This will be repeated until the AR program is completed or scraped/morphed into a new program

Meeting Minutes

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 7/10/2021 2:47pm Week [10]

In attendance
Alex
Andrew
Austin
Hamish
Josh
Wei
Brock

Apologies

Absent

Agenda

- Matters arising from previous meeting
  No prior meeting

- Agenda items (as needed)
  - Transitioning from a low-fidelity prototype to a high fidelity one
  - Interactivity
  - Suggested mediums: XD, powerpoint, html website, video of walking around an art gallery with the interface shown
  - Unity has been chosen for now as the desired medium
  - Work on report can be done up till problem domain, the rest will require a working prototype

- Date, time and place for next meeting
- 11/10/2021 Discord

- Matters for consideration at next meeting
    - Is Unity a good choice for the prototype? Can everyone use it effectively?

Action sheet

Task	Responsible	Due	Notes
Download and try out Unity	Everyone	11/10	version 2021.1.23f1
Report: Problem Domain	Austin	11/10	What user problem are you trying to solve? Who are the users? What are their important tasks? What emotional state would be ideal for your users to be in?

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 11/10/2021 7:00pm Week [11]

In attendance
Alex
Andrew
Austin
Hamish
Josh
Wei
Brock

Apologies

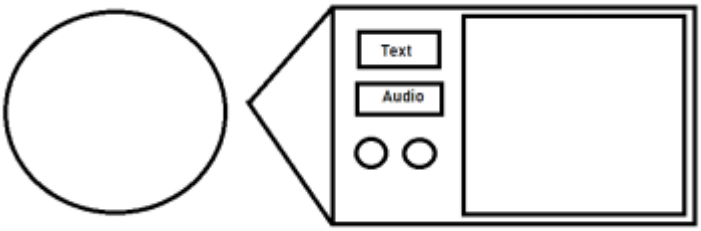
Absent

Agenda

- Matters arising from previous meeting
  Unity prototype testing

- Agenda items (as needed)
  - Unity was more complicated to utilise than assumed in the previous meeting
  - Alternative forms for prototype is utilising Justinmind
  - Need to solidify interface aesthetics
  - need to add the improvements made to testing
  - Style similar to sci-fi, neon, blueish? (Like Halo)
  - prototype should be navigated similar to point-and-click adventure games
  - Introduce orb immediately to prevent confusion
  - On start screen
  - Orb should be included in the additional information scenario
  - Minimap should always be visible
  - Navigation button should always be visible
  - Orb controls should always be visible

- Map should expand
- basic integration of scenario 1 and 2 shown below



- Date, time and place for next meeting
- 14/10/2021 Discord

- Matters for consideration at next meeting

Action sheet

Task	Responsible	Due	Notes
Download and try out JustinMind	Everyone	11/10	
Develop aesthetics for interface	Everyone	11/10	Inspiration for design 
Updating Scenario 1	Josh, Hamish,	11/10	
Updating Scenario 3	Austin, Alex, Brock	11/10	
Updating Scenario 2	Andrew,Wei	11/10	

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 14/10/2021 3:20pm Week [11]

In attendance
Alex
Andrew
Austin
Hamish
Josh
Wei
Brock

Apologies

Absent

Agenda

- Matters arising from previous meeting
  Development of prototype

- Agenda items (as needed)
  - Group from previous assignment requires testers
  - Prototype developing at confident pace
  - Need to add orb mechanic to the additional information scenario

- Date, time and place for next meeting
- 18/10/2021 Discord

- Matters for consideration at next meeting

Action sheet

Task	Responsible	Due	Notes
Add orb to additional information scenario	Andrew	18/10/2021	
Work on prototype	everyone	18/10/2021	
Test other teams prototype	everyone		

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 19/10/2021 1:00pm Week [12]

In attendance
Alex
Andrew
Austin
Hamish
Josh
Wei
Brock

Apologies

Absent

Agenda

- Matters arising from previous meeting
  Development of prototype

- Agenda items (as needed)
  - Scenario 3 is complete
  - Orb functionality for Scenario 1 is complete
  - Tutorial is mostly complete
  - Presentation script needs to be developed for video
  - 50% of the presentation needs to be focused on the prototype
  - Script should be more conversational
  - Hamish is producing an outline for the presentation
  - Getting the Orb to move around in the painting slide is causing difficulties
  - Suggested idea is to record everyone's audio on discord, Wei suggested he stream the prototype and record on his pc

- Date, time and place for next meeting
- 22/10/2021 Discord

- Matters for consideration at next meeting
    - Record presentation

Action sheet

Task	Responsible	Due	Notes
Presentation Outline	Hamish		*He did it in the meeting*

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 22/10/2021 1:00pm Week [12]

In attendance
Alex
Andrew
Austin
Hamish
Wei
Josh
Apologies

Absent
Brock

Agenda

- Matters arising from previous meeting
  Development of prototype

- Agenda items (as needed)
  - Video presentation is ready
  - Work on report is needed
  - Alex has already done work on Implementation/Prototype
  - Austin has practically finished Problem Domain and is doing the Meeting Minutes

- Date, time and place for next meeting
- 27/10/2021 Discord 1pm

- Matters for consideration at next meeting
  - Report consolidation and submission

Action sheet

Task	Responsible	Due	Notes
Problem Domain	Austin	Done Already	No need to assign anyone its already covered
Design	Everyone	29/10/2021	Describe the final design of your interface. Illustrate with screenshots. Point out important design decisions and discuss the design alternatives that you considered. Particularly, discuss design decisions that were motivated by the early evaluations you cond
Implementation/Prototype	Alex	29/10/2021	Describe the internals of your hi-fidelity prototype, but keep the discussion on a high level. Mention any technical feasibility problems that may arise.
Evaluation	Austin Hamish Brock	29/10/2021	Describe how you conducted your user tests. Describe how you found your users and how representative they are of your target user population. Describe how users were briefed and what tasks they performed; if you did a demo for them as part of your briefing, justify that decision. List the usability problems you found, and discuss how you might solve them. Discuss any problems you found with the testing procedure. Include all scenarios, briefings and data collected during evaluation. Summarise and analyse the data as well as material drawn from user satisfaction questionnaires or interviews. This section should comprise the majority of your report.
Reflection	Josh Andrew Wei	29/10/2021	Discuss what you learned over the course of the iterative design process. If you did it again, what would you do differently? Focus in this part is not on the specific design decisions of your project (which you already discussed in the

			Design section), but instead on the meta-level decisions about your design process: your risk assessments, your decisions about what features to prototype and which prototype techniques to use, how you evaluated the results of your observations and what the next steps would be. This section will probably be the most valuable section of your report
Meeting Summary	Austin	29/10/2021	This is also already covered

SENG2260 Human-Computer Interaction

Minutes of meeting

Team Awaken
Place: Discord
Date/Time: 28/10/2021 2:00pm Week [12]

In attendance
Austin
Alex
Andrew
Josh
Hamish
Wei
Apologies

Absent
Brock

Agenda

- Matters arising from previous meeting
  Development of prototype

- Agenda items (as needed)
  - Report progress update
  - Consolidating final report

- Date, time and place for next meeting
- 27/10/2021 Discord 1pm

- Matters for consideration at next meeting
  - Record presentation

Action sheet

Task	Responsible	Due	Notes
Compile report sections into single document	Hamish	29/10/2021	
FINISH YOUR SECTIONS	Everyone	Tonight (with some flexibility)	